FILE COPY

10/050,593

DIALOG

Set	Items	Description
S1	20167	RHIZOBIA OR RHIZOBIAL
S2	107450	LEGUME OR LEGUMINOUS
S3	5264	S1 AND S2
S4	4	S3 AND HERBICIDE(W)RESISTANT
S5	4	RD S4 (unique items)
S6	4	S5 NOT PY>2001
S7	24	S3 AND (SUPERIOR(N5)NITROGEN(N5)(FIXING OR FIXATION))
S8	7	RD S7 (unique items)
S9	6	S8 NOT PY>2001

6/3/1 (Item 1 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

03672443 Genuine Article#: PW772 No. References: 46
Title: INSECTICIDAL ACTIVITY AND COMPETITIVENESS OF RHIZOBIUM SPP CONTAINING THE BACILLUS-THURINGIENSIS SUBSP TENEBRIONIS DELTA-ENDOTOXIN GENE (CRYIII) IN **LEGUME** NODULES
Author(s): BEZDICEK DF; QUINN MA; FORSE L; HERON D; KAHN ML
Corporate Source: WASHINGTON STATE UNIV,DEPT CROP & SOIL SCI/PULLMAN//WA/99164; USDA,ANIM & PLANT HLTH INSPECT SERV/HYATTSVILLE//MD/20782; WASHINGTON STATE UNIV,INST BIOL CHEM,DEPT MICROBIOL/PULLMAN//WA/99164
Journal: SOIL BIOLOGY & BIOCHEMISTRY, 1994, V26, N12 (DEC), P1637-1646
ISSN: 0038-0717
Language: ENGLISH Document Type: ARTICLE (Abstract Available)

6/3/2 (Item 2 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

03615806 Genuine Article#: PR206 No. References: 50
Title: ENOD40, A GENE EXPRESSED DURING NODULE ORGANOGENESIS, CODES FOR A NONTRANSLATABLE RNA INVOLVED IN PLANT-GROWTH
Author(s): CRESPI MD; JURKEVITCH E; POIRET M; DAUBENTONCARAFA Y; PETROVICS G; KONDOROSI E; KONDOROSI A
Corporate Source: CNRS,INST SCI VEGETALES/F-91198 GIF SUR YVETTE//FRANCE/; CNRS,INST SCI VEGETALES/F-91198 GIF SUR YVETTE//FRANCE/; CNRS,CTR GENET MOLEC/F-91198 GIF SUR YVETTE//FRANCE/; HUNGARIAN ACAD SCI,BIOL RES CTR,INST GENET/H-6701 SZEGED//HUNGARY/
Journal: EMBO JOURNAL, 1994, V13, N21 (NOV 1), P5099-5112
ISSN: 0261-4189
Language: ENGLISH Document Type: ARTICLE (Abstract Available)

6/3/3 (Item 3 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

03503682 Genuine Article#: PH746 No. References: 47
Title: THE EFFECT OF TOXIN-PRODUCING RHIZOBIUM STRAINS, ON LARVAE OF SITONA-FLAVESCENS FEEDING ON **LEGUME** ROOTS AND NODULES
Author(s): SKOT L; TIMMS E; MYTTON LR
Corporate Source: AFRC,INST GRASSLAND & ENVIRONM RES,PLAS GOGERDDAN/ABERYSTWYTH SY23 3EB/DYFED/WALES/
Journal: PLANT AND SOIL, 1994, V163, N1 (JUN), P141-150
ISSN: 0032-079X
Language: ENGLISH Document Type: ARTICLE (Abstract Available)

6/3/4 (Item 1 from file: 357)
DIALOG(R)File 357:Derwent Biotech Res.

0055319 DBA Accession No.: 86-13167 PATENT
Herbicide resistant Rhizobium production - by repeatedly treating with herbicide solution, inoculating leguminosae seeds, sowing and isolating
PATENT ASSIGNEE: Takarmanytermesztes. 1986
PATENT NUMBER: HU T038598 PATENT DATE: 860630 WPI ACCESSION NO.: 86-214188 (8633)
PRIORITY APPLIC. NO.: HU 833617 APPLIC. DATE: 831019
NATIONAL APPLIC. NO.: HU 833617 APPLIC. DATE: 831019

LANGUAGE: Hungarian

? t s6/k/1-4
>>>KWIC option is not available in file(s): 41, 77, 399

6/K/1 (Item 1 from file: 34)
DIALOG(R)File 34:(c) 2002 Inst for Sci Info. All rts. reserv.

...Title: COMPETITIVENESS OF RHIZOBIUM SPP CONTAINING THE BACILLUS-THURINGIENSIS SUBSP TENEBRIONIS DELTA-ENDOTOXIN GENE (CRYIII) IN **LEGUME** NODULES
...Abstract: utilization or a conditional nifH promoter that is involved in nitrogen fixation. The cryIII-containing **rhizobia** (i.e. C1-pBtt-LZ and C1-pBtt-nH) expressed toxin in sufficient quantities within...

...Pisum sativum and Sitona hispidulus on Medicago sativa. The pRK311 plasmid remained stable in the **rhizobia** that were either free-living or within nodules of the legumes. The engineered cryIII-containing...
...Research Fronts: 006 (MICROPROJECTILE BOMBARDMENT; TRANSGENIC RICE (ORYZA-SATIVA L) PLANTS; INSECTICIDAL CRYSTAL PROTEIN GENE; STABLY TRANSFORMED **HERBICIDE RESISTANT** CALLUS)
92-4812 001 (PUTATIVE ANAEROBIC COPROPORPHYRINOGEN-III OXIDASE IN RHODOBACTER-SPHAEROIDES; TRANSCRIPTIONAL REGULATORY ELEMENT...

6/K/2 (Item 2 from file: 34)
DIALOG(R)File 34:(c) 2002 Inst for Sci Info. All rts. reserv.

...Abstract: inducing root nodules. However, certain Medicago plants can form nodules spontaneously, in the absence of **rhizobia**. A differential screening was performed using spontaneous nodule versus root cDNAs from Medicago sativa ssp...
...Research Fronts: INDUCIBLE NODULATION GENES; RHIZOBIUM-LEGUMINOSARUM BIOVAR VICIAE; PEA ROOT NODULE DEVELOPMENT; AUXIN TRANSPORT; MOLECULAR SIGNALS; **LEGUME** SYMBIOSIS)
92-0805 001 (MICROPROJECTILE BOMBARDMENT; TRANSGENIC RICE (ORYZA-SATIVA L) PLANTS; INSECTICIDAL CRYSTAL PROTEIN GENE; STABLY TRANSFORMED **HERBICIDE RESISTANT** CALLUS)
92-4812 001 (PUTATIVE ANAEROBIC COPROPORPHYRINOGEN-III OXIDASE IN RHODOBACTER-SPHAEROIDES; TRANSCRIPTIONAL REGULATORY ELEMENT...

6/K/3 (Item 3 from file: 34)
DIALOG(R)File 34:(c) 2002 Inst for Sci Info. All rts. reserv.

Title: THE EFFECT OF TOXIN-PRODUCING RHIZOBIUM STRAINS, ON LARVAE OF SITONA-FLAVESCENS FEEDING ON **LEGUME** ROOTS AND NODULES
Abstract: Larvae of the weevil Sitona spp. specifically eat the root nodules formed on **legume** plants by the soil bacterium Rhizobium, This can adversely affect the nitrogen fixing activity in the root nodules and lead to decreases in yield. Transgenic **rhizobia** were used in a novel approach to the biological control of Sitona. Two transcriptional fusions...

...larvae of Sitona flavescens, In both white clover and pea plants nodulated by the transgenic **rhizobia** a slightly smaller proportion of root nodules were damaged compared to the wild type control...
...Research Fronts: 002 (MICROPROJECTILE BOMBARDMENT; TRANSGENIC RICE (ORYZA-SATIVA L) PLANTS; INSECTICIDAL CRYSTAL PROTEIN GENE; STABLY TRANSFORMED **HERBICIDE RESISTANT** CALLUS)
92-4812 002 (PUTATIVE ANAEROBIC COPROPORPHYRINOGEN-III OXIDASE IN RHODOBACTER-SPHAEROIDES; TRANSCRIPTIONAL REGULATORY ELEMENT...

...INDUCIBLE NODULATION GENES; RHIZOBIUM-LEGUMINOSARUM BIOVAR VICIAE; PEA ROOT NODULE DEVELOPMENT; AUXIN TRANSPORT; MOLECULAR SIGNALS; **LEGUME** SYMBIOSIS)
92-3056 001 (UPTAKE OF SURFACTANT PROTEIN-B; CASEIN KINASE-II; CATALYTIC SUBUNITS)
92...

6/K/4 (Item 1 from file: 357)

Herbicide resistant Rhizobium production
ABSTRACT: **Rhizobia** with good herbicide tolerance are prepared by (1) isolating Rhizobium varieties from the live root tissue of selected high-nitrogen binding leguminosae, (2) treating the **Rhizobia** with herbicides normally used during the cultivation of leguminosae and other important crops like wheat and maize, (3) inoculating a synthetic mixture of the most important leguminosae with the **Rhizobia** surviving the herbicide treatment and (4) sowing the seeds of the inoculated leguminosae into seed trays containing soil which has never grown soybeans. **Rhizobia** are isolated from the roots of resulting plants. Preferably, the process is repeated 3-4 times with increasing herbicide concentrations. The process is finally scaled up to fields, the resulting **Rhizobia** being mixed with herbicide solutions and applied to the soil.
DESCRIPTORS: Rhizobium generation with improved herbicide resistance, strain improvement, nitrogen-fixation, **legume** bacterium pesticide resistance plant
?

9/3/1 (Item 1 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)

10138901 BIOSIS NO.: 199698593819
Preference in the nodulation of Phaseolus vulgaris cultivar RAB39.
AUTHOR: Montealegre C; Graham P H(a); Kipe-Nolt J A
AUTHOR ADDRESS: (a)Rhizobium Res. Lab., Dep. Soil Water Climate, Univ. Minnesota, St. Paul, MN 55108**USA
JOURNAL: Canadian Journal of Microbiology 41 (11):p992-998 1995
ISSN: 0008-4166
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

9/3/2 (Item 2 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)

10007328 BIOSIS NO.: 199598462246
Manipulation of **rhizobia** microflora for improving **legume** productivity and soil fertility: A critical assessment.
AUTHOR: Brockwell John(a); Bottomley Peter J; Thies Janice E
AUTHOR ADDRESS: (a)CSIRO Div. Plant Ind., GPO Box 1600, Canberra, ACT 2601 **Australia
JOURNAL: Plant and Soil 174 (1-2):p143-180 1995
ISSN: 0032-079X
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

9/3/3 (Item 3 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)

08265406 BIOSIS NO.: 000094046579
POTENTIAL FOR INCREASING NITROGEN FIXATION IN GRAIN LEGUMES
AUTHOR: BUTTERY B R; PARK S J; HUME D J
AUTHOR ADDRESS: AGRIC. CANADA RES. STATION, HARROW, ONT. N0R 1G0, CAN.
JOURNAL: CAN J PLANT SCI 72 (2). 1992. 323-349. 1992
FULL JOURNAL NAME: Canadian Journal of Plant Science
CODEN: CPLSA
DOCUMENT TYPE: Review
RECORD TYPE: Abstract
LANGUAGE: ENGLISH

9/3/4 (Item 1 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

01974535 Genuine Article#: JQ929 No. References: 238
Title: GENETICS OF COMPETITION FOR NODULATION OF LEGUMES
Author(s): TRIPLETT EW; SADOWSKY MJ
Corporate Source: UNIV WISCONSIN,DEPT AGRON/MADISON//WI/53706; UNIV WISCONSIN,CTR STUDY NITROGEN FIXAT/MADISON//WI/53706; UNIV MINNESOTA,DEPT SOIL SCI/ST PAUL//MN/55108; UNIV MINNESOTA,DEPT MICROBIOL/ST PAUL//MN/55108
Journal: ANNUAL REVIEW OF MICROBIOLOGY, 1992, V46, P399-428
ISSN: 0066-4227
Language: ENGLISH Document Type: REVIEW (Abstract Available)

9/3/5 (Item 1 from file: 76)
DIALOG(R)File 76:Life Sciences Collection

00644692 0460822
Field evaluation of selected Rhizobium in an improved **legume** inoculant.
Kremer, R.J.; Peterson, H.L.
Dep. Agron., Univ. Missouri, Columbia, MO 65201, USA
AGRON. J. vol. 75, no. 1, pp. 139-143 (1983.)
DOCUMENT TYPE: Journal article LANGUAGE: ENGLISH
SUBFILE: Microbiology Abstracts Section B: Bacteriology; Microbiology Abstracts Section A: Industrial and Applied Microbiology

9/3/6 (Item 1 from file: 98)
DIALOG(R)File 98:General Sci Abs/Full-Text

03790963 H.W. WILSON RECORD NUMBER: BGSI98040963 (USE FORMAT 7 FOR FULLTEXT)
Legumes may be symbiont-limited during old-field succession.
Larson, Jennifer L
Siemann, Evan
The American Midland Naturalist (Am Midl Nat) v. 140 no1 (July '98) p. 90-5
SPECIAL FEATURES: bibl il ISSN: 0003-0031
LANGUAGE: English
COUNTRY OF PUBLICATION: United States
WORD COUNT: 2057
?

9/3/1 (Item 1 from file: 5)
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10138901 BIOSIS NO.: 199698593819
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AUTHOR: Montealegre C; Graham P H(a); Kipe-Nolt J A
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JOURNAL: Canadian Journal of Microbiology 41 (11):p992-998 1995
ISSN: 0008-4166
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

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Manipulation of **rhizobia** microflora for improving **legume** productivity and soil fertility: A critical assessment.
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JOURNAL: Plant and Soil 174 (1-2):p143-180 1995
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LANGUAGE: English

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JOURNAL: CAN J PLANT SCI 72 (2). 1992. 323-349. 1992
FULL JOURNAL NAME: Canadian Journal of Plant Science
CODEN: CPLSA
DOCUMENT TYPE: Review
RECORD TYPE: Abstract
LANGUAGE: ENGLISH

9/3/4 (Item 1 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

01974535 Genuine Article#: JQ929 No. References: 238
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Author(s): TRIPLETT EW; SADOWSKY MJ
Corporate Source: UNIV WISCONSIN,DEPT AGRON/MADISON//WI/53706; UNIV WISCONSIN,CTR STUDY NITROGEN FIXAT/MADISON//WI/53706; UNIV MINNESOTA,DEPT SOIL SCI/ST PAUL//MN/55108; UNIV MINNESOTA,DEPT MICROBIOL/ST PAUL//MN/55108
Journal: ANNUAL REVIEW OF MICROBIOLOGY, 1992, V46, P399-428
ISSN: 0066-4227
Language: ENGLISH Document Type: REVIEW (Abstract Available)

9/3/5 (Item 1 from file: 76)
DIALOG(R)File 76:Life Sciences Collection
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00644692 0460822
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Kremer, R.J.; Peterson, H.L.
Dep. Agron., Univ. Missouri, Columbia, MO 65201, USA
AGRON. J. vol. 75, no. 1, pp. 139-143 (1983.)
DOCUMENT TYPE: Journal article LANGUAGE: ENGLISH
SUBFILE: Microbiology Abstracts Section B: Bacteriology; Microbiology Abstracts Section A: Industrial and Applied Microbiology

9/3/6 (Item 1 from file: 98)
DIALOG(R)File 98:General Sci Abs/Full-Text
(c) 2002 The HW Wilson Co. All rts. reserv.

03790963 H.W. WILSON RECORD NUMBER: BGSI98040963 (USE FORMAT 7 FOR FULLTEXT)
Legumes may be symbiont-limited during old-field succession.
Larson, Jennifer L
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The American Midland Naturalist (Am Midl Nat) v. 140 no1 (July '98) p. 90-5
SPECIAL FEATURES: bibl il ISSN: 0003-0031
LANGUAGE: English
COUNTRY OF PUBLICATION: United States
WORD COUNT: 2057
? t s9/k/1-6
>>>KWIC option is not available in file(s): 41, 77, 399

9/K/1 (Item 1 from file: 5)
DIALOG(R)File 5:(c) 2002 BIOSIS. All rts. reserv.

ABSTRACT: The low nodule occupancy achieved by **superior nitrogen-fixing** inoculant strains is a problem in the production of many traditional **legume** species. including Phaseolus vulgaris. Cultivars that select for inoculant strains, rather than nodulate with ineffective indigenous **rhizobia**, offer one approach to the resolution of this problem. In this study we identify a...

9/K/2 (Item 2 from file: 5)
DIALOG(R)File 5:(c) 2002 BIOSIS. All rts. reserv.

Manipulation of **rhizobia** microflora for improving **legume** productivity and soil fertility: A critical assessment.

...ABSTRACT: augmented as the world's population increases and as the natural resources that supply fertilizer **nitrogen** diminish. This objective will be achieved through the development of **superior legume** varieties, improvement in agronomic practice, and increased efficiency of the **nitrogen fixation** process itself by better management of the symbiotic relationship between plant and bacteria. This paper...

...nodule bacteria, established and introduced, can be manipulated ecologically, agronomically, edaphically and genetically to improve **legume** productivity and, as a consequence, soil fertility.
MISCELLANEOUS TERMS: ...**LEGUMINOUS** TREES...

...**RHIZOBIAL** ECOLOGY...

...**RHIZOBIAL** GENETICS

9/K/3 (Item 3 from file: 5)
DIALOG(R)File 5:(c) 2002 BIOSIS. All rts. reserv.

...ABSTRACT: review considers the main factors determining the level of nitrogen fixation in the major grain-**legume** crops (chickpea, common bean, cowpea, faba bean, lentil, pea, peanut, pigeon pea and soybean) and ...

...various crops to both the addition of nitrogen fertilizer and inoculation with effective strains of **rhizobia** are discussed. The present situation and future prospects for increasing **nitrogen fixation** through plant breeding, development of **superior** strains, **superior** host-strain combinations, improved inoculation techniques, bioengineering and other non-traditional methods are discussed. The...

9/K/4 (Item 1 from file: 34)
DIALOG(R)File 34:(c) 2002 Inst for Sci Info. All rts. reserv.

Abstract: An economically important problem in microbial ecology concerns the efficacy of **rhizobial** inoculants for the formation of nitrogen-fixing root nodules on **legume** crop plants such as soybean, alfalfa, and clover. Some strains of **rhizobia** can increase symbiotic nitrogen fixation under controlled conditions. However, attempts to improve nitrogen fixation under...

...conditions with such strains often fail, usually as a result of the presence of indigenous **rhizobia** limiting nodulation by the inoculum strains. This problem is referred to as the Rhizobium competition...

...is being used to address the problem from two perspectives. First, the host specificity of **rhizobia** is being characterized with the long term goal of developing strains that can nodulate a very strain-specific host-**legume** genotype. Second, the genetic basis of competitiveness in several strains is being examined. Genetic determinants...

...nodulation competitiveness have been isolated and mechanisms for their stable integration into the genome of **superior nitrogen-fixing** strains have been developed. Several phenotypes have been identified as playing an important role in...

9/K/5 (Item 1 from file: 76)
DIALOG(R)File 76:(c) 2002 Cambridge Sci Abs. All rts. reserv.

Field evaluation of selected Rhizobium in an improved **legume** inoculant.

Increased grain **legume** production depends on effective symbiotic di-nitrogen fixation through successful **legume** inoculation. Inoculants containing high numbers (greater than or equal to 10 super(7)/g) of...

...must withstand adverse field conditions. Field studies were performed to determine the effects of selected **rhizobia** in two different inoculant carriers on nodulation and performance of three grain legumes. The

experiments...

...of effective Rhizobium at planting. Through subsequent effective nodulation, oil-base inoculants increased yields and **nitrogen fixation** by the legumes due to increased nodulation by the **superior** N sub(2)-fixing strains of Rhizobium).

9/K/6 (Item 1 from file: 98)
DIALOG(R)File 98:(c) 2002 The HW Wilson Co. All rts. reserv.

(USE FORMAT 7 FOR FULLTEXT)

...ABSTRACT: be rare throughout secondary succession in nitrogen-poor grasslands due to a lack of suitable **rhizobia** and consequently lower growth rates. Reprinted by permission of the publisher.

TEXT:
... soil nitrogen concentration increases (Gorham et al., 1979; Inouye et al., 1987). At low soil **nitrogen** concentrations, **nitrogen-fixing** legumes can be competitively **superior** to nonlegumes. However, studies at Cedar Creek have found that legumes are always rare and ...

...effect. They may also be at a competitive disadvantage due to a lack of compatible **rhizobia** that limit the formation of nodules.

Rhizobia differ in their ability to infect different species of plants (Bergey et al., 1984; Paul...

...abandonment of a field previously planted with soybeans, there may initially be an abundance of **rhizobia**. Through time, the numbers of these **rhizobia** may decline if their corresponding symbiont is not present (Paul and Clark, 1989; Kucey and...

...the ability of soybeans to form nodules will decrease with time since last cultivation. Because **rhizobia** for native legumes may come from accumulation of **rhizobia** in the plant-root environment of colonizing legumes (Weaver et al., 1971), we hypothesized that the number of nodules on roots of native prairie **legume** seedlings may increase with time since abandonment. In order to estimate the nodulation potential of...

...successional ages, we used a bioassay employing Lespedeza capitata (bush clover, a common native prairie **legume** at Cedar Creek) seeds and soybean seeds.

MATERIALS AND METHODS
This work was performed with...

...Because legumes were rare in these fields, this eliminated the bias from sampling at a **legume** but may have biased our **rhizobia** abundance estimates to be slightly too low.

Before planting, the Lespedeza and soybean seeds were surface sterilized to reduce **rhizobia** numbers from the seed surface, and scarified to increase the germination of the seeds using...

...3 .

DISCUSSION
We used nodule number as an indicator of the relative abundance of compatible **rhizobia** in the soil through succession. The number of nodules per soybean plant decreased significantly with...

...younger fields, especially those previously planted with soybeans, one

might expect a greater number of **rhizobia** compatible with soybean seedlings (Bradyrhizobium japonicum, Bergey et al., 1984) than ...with soybeans. Our regression results suggest that only half as many of these soybean compatible **rhizobia** are left in the soil after 30-40 yr.

The opposite might be expected with Lespedeza, which are incompatible with soybean **rhizobia** (Bergey et al., 1984); older fields would have more **rhizobia** compatible with Lespedeza (a promiscuous Bradyrhizobium species, Bergey et al., 1984) due to their accumulation in the soil over time with the continued presence of the corresponding **legume**(s). We found a low number of nodules on plants grown in soil from young... ...numbers in soils from older fields suggest that older fields may be poor environments for **rhizobia** or nodulation.

Controlling for the relationship between number of nodules and Lespedeza plant size, Lespedeza...

...Putten et al., 1993). These factors, together with the low abundances of compatible and effective **rhizobia** in early succession, may limit the rate of succession on nutrient-poor soils by limiting...

...poor soil. Ecology, 76:2648-2655.

SOMASEGARAN, P. AND H. J. HOBEN. 1994. Handbook for **rhizobia**: methods in **legume** and rhizobium technology. Springer-Verlag, New York. 450 p.

TILMAN, D. 1982. Resource competition and...

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